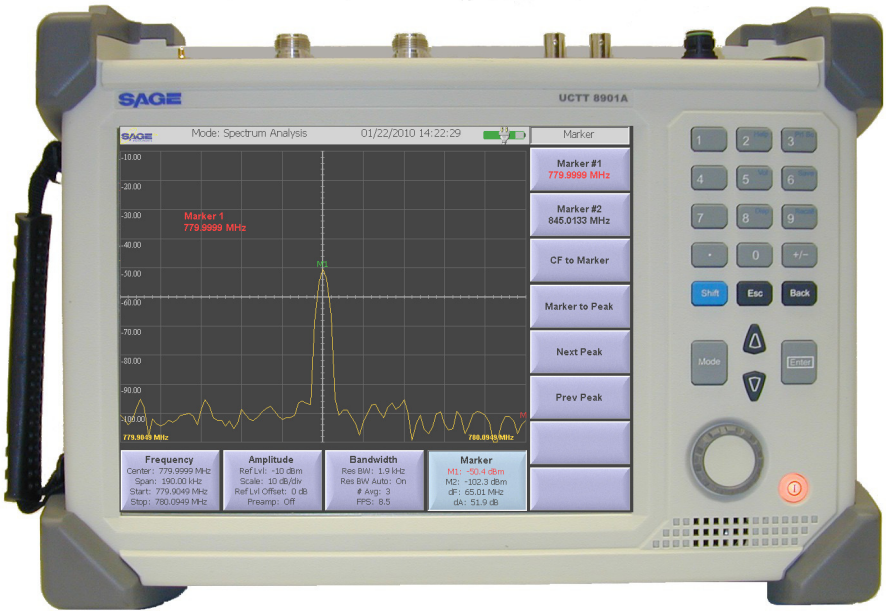
UCTT 8901A



User Manual

Rev A 3/2010

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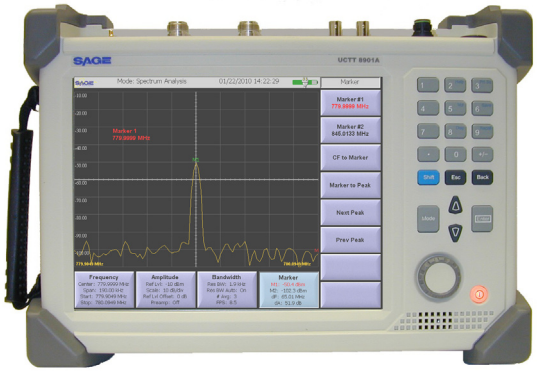


Quick Start Guide

These links provide a quick overview of the UCTT operation and menus. This information allows most users to start running tests on the UCTT with a minimum of reading.

Step 1: Descriptions of User Controls

Step 2: Menus and Screen Navigation

Topics of Interest

User Control Description
Menu System Overview
Battery Replacement
Managing Options
Remote Control Commands
System Admin Menus
Upgrading Software

1. Getting Started

Introduction

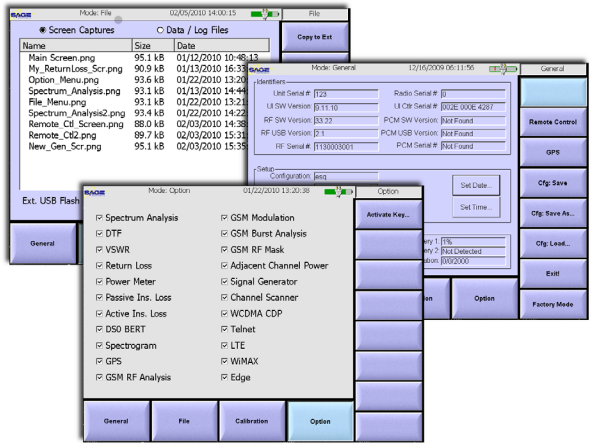
The UCTT is a powerful multi-functional test instrument containing a comprehensive set of measurement resources for the cellular industry. While the UCTT combines several complex instruments into one package, the menu and user interface has a simple consistency that allows intuitive operation for most users familiar with cellular testing and maintenance practices. The following section highlights the portions of the manual that should be reviewed to get started testing with the UCTT.

1.1 Quick Start Process

The material required to get up and testing with the UCTT is listed below. The other remaining sections of the manual describe the menus and general system maintenance in more detail.

User Control Section:
An overview of the front panel controls and their functions.

Menus and Screen Navigation Section:
Describes the common menu scheme that is used by the UCTT.



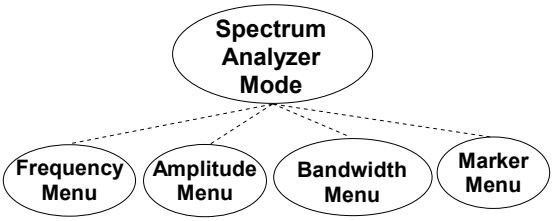
1.2 Unpacking

When your new UCTT test instrument arrives from the factory, the shipping box should contain the following components:

Packing List

- SAGE UCTT 8901A Cellular Test Unit
- Power Cord
- Charger/Power Supply
- Calibration Cord
- SAGE UCTT User Manual, supplied on CD in printable PDF format.

Remove the components from the shipping carton and inspect contents. Notify SAGE Instruments immediately of any damage.



2. Physical Properties

Introduction

The UCTT is packaged in a ruggedized case providing a powerful and compact test solution that can withstand the harsh environments encountered in the field. This section describes the front panel display and controls, test connector panel and battery packs.

Figure 2.1 UCTT Front Panel

2.1 Front Panel

The UCTT front panel is shown in Figure 2.1. The front panel consists of a 10.4 inch SVGA touch screen display. To the right of the display are the keypad, selection wheel and power button. These controls along with the touch screen allow the user to configure the test menus and perform measurements.

2.1.1 Power Button

The power button is located in the lower right corner of the front panel. The power is toggled on or off by holding the power button for a second or longer.
The power button also functions as a charge indicator, displaying the status of the battery charge. The table below shows the different states for this indicator.

Battery Charge/Power Indicator States

Charge Indicator	Battery Charge	UUCT Power State	External Power
Green	Full	On	Yes
Blinking Green	Medium	On	Yes
Blinking Amber	Low	On	Yes
Green	Full	On	No
Green	Medium	On	No
Amber	Low	On	No
Amber	Full	Off	Yes
Amber	Medium	Off	Yes
Blinking Amber	Low	Off	Yes

Medium charge level is 88 to 18 percent of full charge.
Low charge level is below 18 percent of full charge.
Blinking Red indicates a battery or charging malfunction. If this occurs turn off the unit, remove and reinstall the battery(s) and power up the unit again. If the battery status indicator continues to blink red contact Sage for assistance.

2.1.2 Keypad and Selection Wheel

The keypad and selection wheel are shown in Figure 2.2. The numeric keys are used to enter values into the menus. Some of the numeric keys also have alternate functions. These can be accessed by pressing the **blue shift key** then the desired alternate function key. The menu bar on the LCD screen will display the word Shift, when the shift key has been pressed and alternate functions can be selected. The alternate functions available are Save, Recall and Prt Sc.

The **Save** function is used to save a snapshot of the results for the currently running test. When the Save key is pressed, the UCTT will prompt the user for a file name and user comment for the results. These results can be displayed along with the file name and comment as an overlay for other tests, or the results file can be exported for analysis. The results file contains test data points in a CSV (Comma Separated Value) format.

The **Recall** key can be used during a test to recall a stored result overlay. When the Recall button is pressed the UCTT will prompt the user to select among the stored result files. For information on exporting test results to an external system see the Exporting Files section of the manual.

The **Prt Sc** key is used to take a screen capture image of the LCD display. When the Prt Sc key is pressed, the UCTT will prompt the user for a file name for the screen capture. The screen capture files are stored in the PNG (Portable Network Graphics) format. For information on exporting screen capture files see the Exporting Files section of the manual.

The **Esc** key is located to the right of the blue shift key. It is used to escape or clear text or numeric entry fields.

The **Back** key is used to clear text or numeric entries a character at a time, and to back out of a menu.

The **Mode** button is circled in Figure 2.2. It is used to switch between different instrument modes. This button is of central importance in the menu scheme of the UCTT. Refer to the Menu and Navigation section for more information on the Mode button and the UCTT menu scheme.

To the right of the Mode button is the **Up** and **Down** arrow buttons. These navigation buttons are used to move up or down through a list of menu items, or to increment or decrement a currently selected menu value.

The **Enter** button to the right of the Up and Down buttons is used to confirm an entry or to select an item from a list.

Below the Mode button is the **Selection Wheel** control. This multifunction control combines the functions of the Up, Down and Enter buttons. When navigating a list of items, rotating the knob clockwise moves the highlight down the list, counter clockwise rotation moves the highlight up the list. When performing numeric entries, rotating the knob clockwise increases the value, while counter clockwise rotation decreases the value. Pushing the knob will confirm the entry or select the highlighted item on a list.

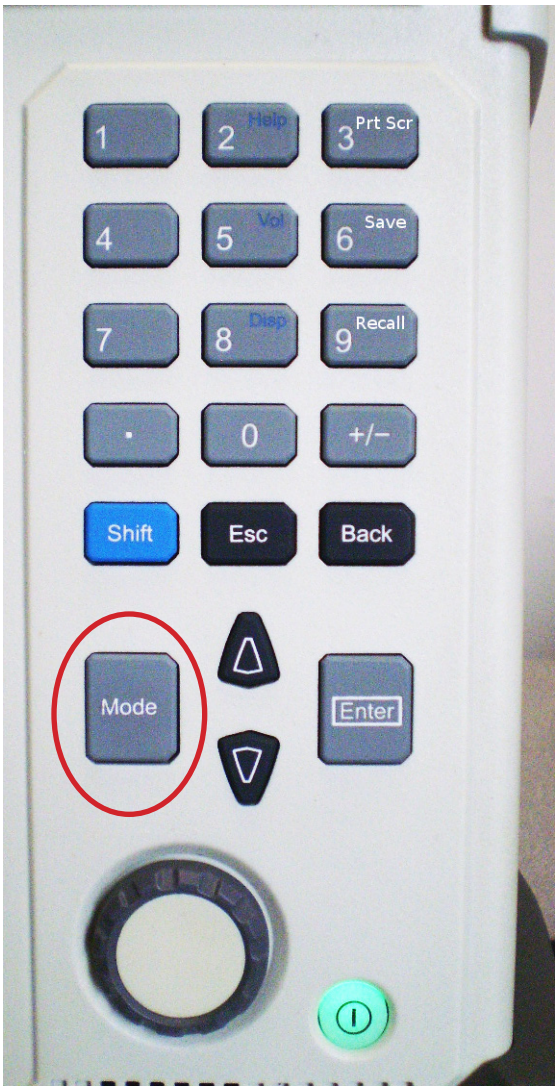
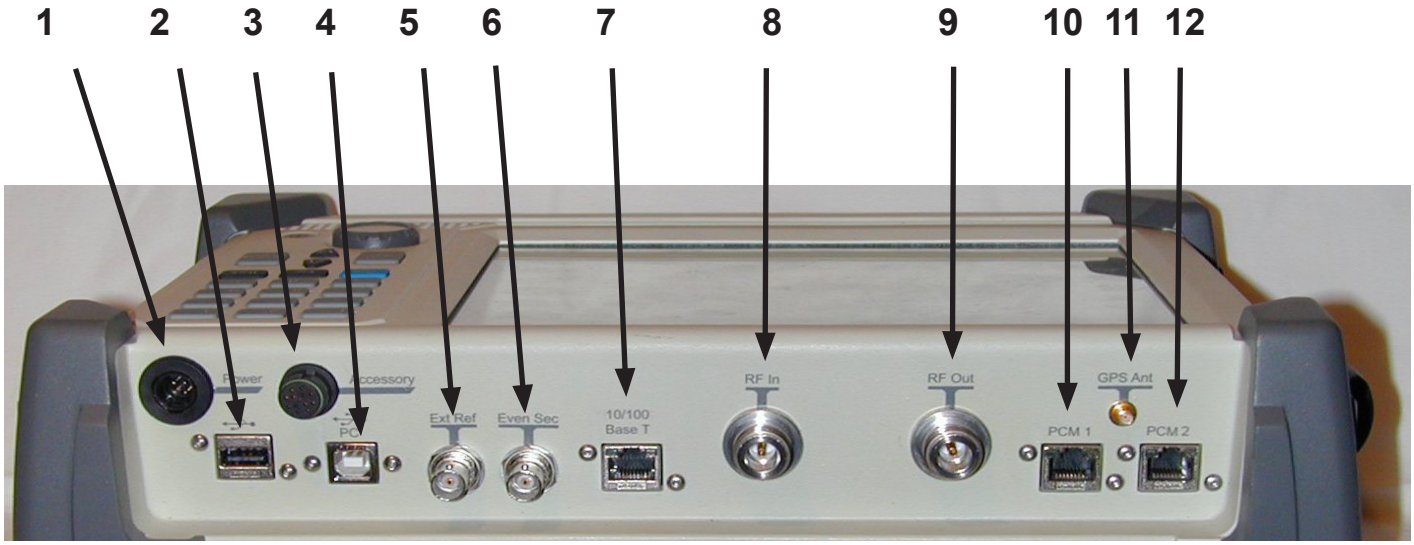


Figure 2.2 UCTT Keypad and Controls

2.2 Connector Panel

The Connector Panel is pictured below along with a description of each connector.



1. **Power Connector** - used to connect the external supply/battery charger to the UCTT. **Warning**, only use the Sage provided charger/power adapter. Using other adapters may pose a hazard to the user or may damage the UCTT.

2. **USB Type A Connector** - used to attach memory storage devices for retrieving test result, log or screen capture files from the UCTT. For more information on exporting files from the UCTT see the Exporting Files section of the manual. This USB connector may also be used to upgrade the system software. For more information on upgrading the system software see the Upgrading Software section of the manual.

3. **Accessory Connector** - Used for attaching external adapters, applications include audio headset connection, and VGA output for an external monitor or projector. Contact the factory for availability.

4. **USB Type B Connector** - Used for connecting a computer to the UCTT.

5. **External Reference Connector** - Used as an external timing reference for UCTT measurements.

6. **Even Second Connector** - Used to supply the even second clock reference signal used for long duration measurements.

7. **10/100 Base T Connector** - Ethernet connection for remote control.

8. **RF In Connector** - 50 Ohm Female Type N connector for receiving RF signals.

9. **RF Out Connector** - 50 Ohm Female Type N connector for transmitting RF signals.

10. **PCM 1 Connector** - RJ-45 connector used to connect to a DS-1 level PCM signal to the UCTT

11. **GPS Antenna Connector** - Used to connect a GPS antenna to provide an accurate external timing reference for UCTT measurements.

12. **PCM 2 Connector** - RJ-45 connector used to connect to a DS-1 level PCM signal to the UCTT

2.3 Flip-out Stand

Figure 2.3 shows the stand that flips out of the rear of the unit and allows the UCTT to sit at a comfortable viewing angle while sitting on a desktop or other horizontal surface.

Figure 2.3 Flip-Out Stand

2.4 Battery Pack

The UCTT contains rechargeable battery packs. The standard unit comes with one battery pack, an additional battery pack can be purchased and installed in the unit to provide longer operating life. Battery life varies depending upon operating conditions; however typical battery life in Spectrum Analyzer mode is approximately 2 hours and 45 minutes for one battery pack. The batteries are hot swapable and can be replaced while the unit is powered up. Note that external power should be connected to the UCTT if all batteries are to be removed while the unit is powered up.

The battery status indicators are circled in the General menu pictured in Figure 2.4. The upper indicator in the menu bar displays a graphical representation of the remaining charge in the battery. This battery status indicator is present in all UCTT menus. The Battery Status text boxes, circled in the lower portion of the menu, display the percentage of battery charge remaining in each battery. If no battery is installed, the battery status message is “Not Detected”.

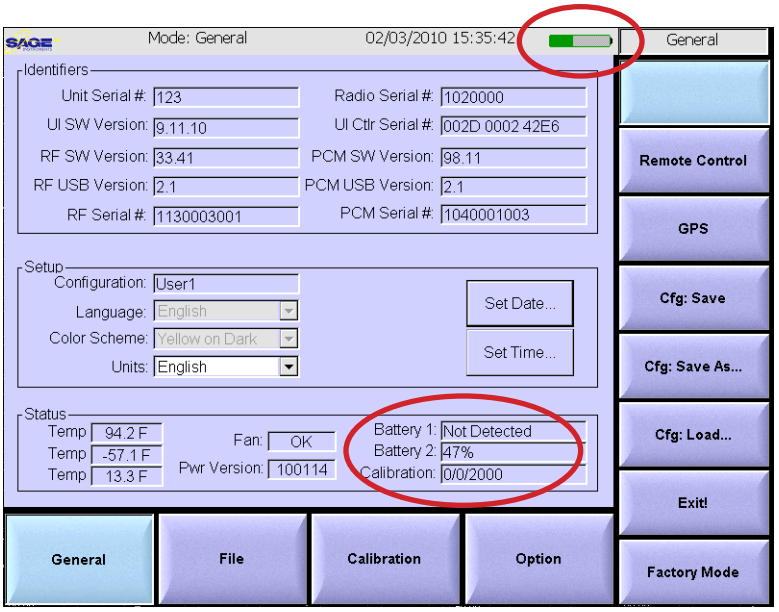


Figure 2.4 General Menu - Battery Status Indicators

2.4.1 Battery Calibration

The UCTT battery packs have advanced charge detection circuitry that accurately predicts the percentage of battery charge remaining. Battery charge capacity can change as the battery ages or is subjected to unusual usage patterns. In order to maintain accuracy, the battery packs must be periodically re-calibrated. The UCTT will indicate a need for battery calibration by displaying the (Calibration Required) message in the Battery Status text box circled in Figure 2.4. For more information on the General menu refer to the System Mode section of the manual. When the Calibration Required message is displayed, the battery pack(s) are recalibrated by first allowing the battery(s) to fully discharge. This can be accomplished by leaving the unit on under battery power till the battery(s) are fully discharged, and the UCTT powers itself off. Then connect the charger to the UCTT and charge the batteries until they are full, this completes the battery calibration procedure.

Figure 2.5 Removing Corner Protector

2.4.2 Battery Removal

The battery packs are located on the left side of the unit. There are lower and upper battery compartments. The following procedure describes assessing the upper battery compartment. The

lower battery compartment is accessed in a similar manner. The batteries are accessed by first removing the rubber corner protector as shown in Figure 2.5.
The battery compartment door is pictured in Figure 2.6. The door is opened by moving the circled tab in the direction of the arrow while pulling the door open.
Once the battery compartment is opened, grasp the tab on the end of the battery and withdraw the battery pack as shown in Figure 2.7.

Figure 2.6 Opening Battery cover

2.4.3 Battery Installation

The battery packs are installed by sliding them into the battery compartment as shown in Figure 2.7. Each battery pack has a slot on one side that should face down toward the bottom of the UCTT. Press the battery firmly into the UCTT battery compartment to engage the connector between the battery and the UCTT. Then close the battery cover and replace the rubber corner protector.

Figure 2.7 Removing/Inserting Battery

3. UCTT Menu Scheme and Navagation

3.1 Test Mode Selection

The UCTT combines the functionality of several conventional test sets ie Spectrum Analyzer, Fault Locator, Bert Analyzer etc. into one package. The menus for controlling all this functionality are organized by instrument type, these are referred to as instrument “modes”. Figure 3.1 shows the Mode Selection dialog box containing a list of the different instrument modes. The Mode dialog box is accessed by pressing the mode button on the UCTT front panel, this is the circled button in Figure 3.2. The Mode selection Dialog is the main or root menu for the UCTT. The Mode button can be pressed at any time to bring up the Mode selection dialog. Note that any test that is running will be terminated when the instrument mode is changed. Once a mode is selected, the menus associated with the test application are displayed and the user can configure and run tests. For example, Figure 3.3 shows the menus that are associated with the Spectrum Analyzer mode. These menus allow the user to configure the spectrum analyzers frequency, amplitude and bandwidth parameters as well as specifying reference marker locations on the results graph.
In addition to test modes, the UCTT has a mode named System. The System mode menus are used to perform system administration tasks. Refer to the System Mode section of the manual for more details on the System menus.

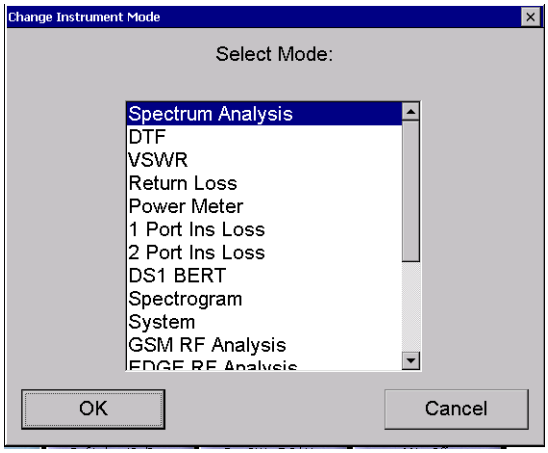


Figure 3.1 Mode Selection Dialog

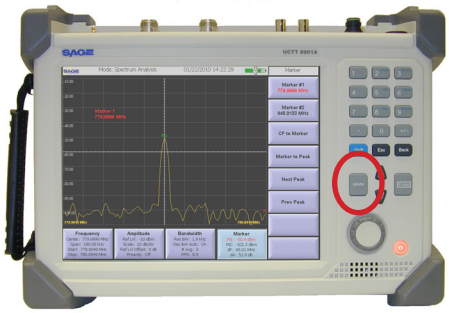


Figure 3.2 Mode Button

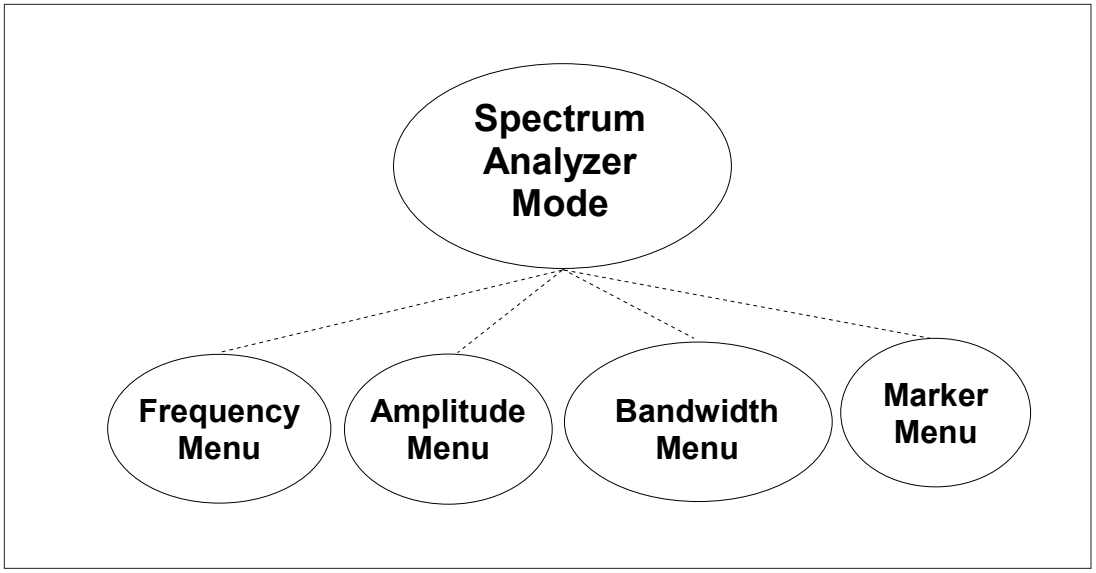


Figure 3.3 Spectrum Analizer Menus

3.2 Menu Description

The UCTT uses a common menu format for all its test and configuration menus. Figure 3.4 shows the Spectrum Analyzer menu with circled items of interest. The circled menu bar at the top of the menu displays the following information from left to right, current instrument mode, time and date, battery condition and current menu name. Note that the Instrument Mode and Menu name are useful indicators when navigating the UCTT menus.

The soft keys along the bottom of the display are for selecting among the menus for the selected test mode. In Figure 3.4 the instrument mode is Spectrum Analyzer, so the soft keys are labeled Frequency, Amplitude, Bandwidth and Marker which match the Spectrum Analyzer menus. When a menu is selected, the corresponding soft key is highlighted to show it is active.

Each menu includes soft keys that appear along the right side of the screen as shown in Figure 3.4. These buttons are generally used to enter values or other configuration information into the test menu, or to back out of the current menu.

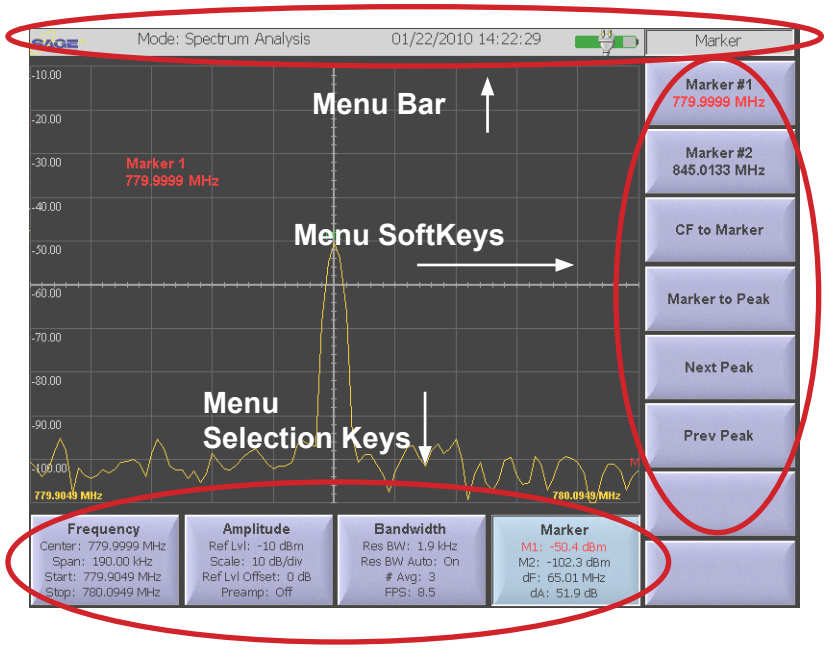


Figure 3.4 Typical UCTT Menu Layout

4. System Configuration Menus

4.1 System Mode

The System Mode is used to perform system administration and general configuration of the UCTT. These tasks include managing results, log and configuration files, setting Time and Date, managing purchased options, software and setting up Remote Control. Pressing the mode button and selecting the System item from the instrument mode list pictured in Figure 4.1 will place the UCTT in the System Mode, and display the General Menu.
In the System mode, the menu selection soft keys are labeled General, File and Options. These correspond to the different configuration menus available. The Calibration soft key is for factory use and does not have an associated menu.

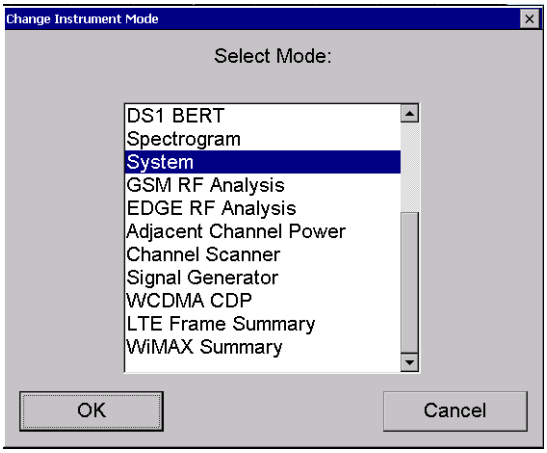


Figure 4.1 System Mode Selection

4.2 General Menu

The General menu is the default menu displayed when the System mode is entered. This menu allows setting Time and Date, checking GPS receiver state, managing user configuration files and initiating remote control. The General menu is shown in Figure 4.2. From the System mode, this menu can be selected by pressing the lower left soft key labeled General.

4.2.1 Set Time and Date

The **Set Time** and **Set Date** buttons are located in the General menu. These buttons are circled in Figure 4.2. Pressing the Set Time or Date button will bring up dialog boxes for setting the time and date for the UCTT. The system time and date are used to timestamp log and result files.

4.2.2 Managing User Configurations

The UCTT can store and load user configurations. This allows the user to save and recall test parameters and system configuration information. Saved user configuration files can be recalled to configure the system for a given test scenario. The Cfg: Save, Cfg: Save As and Cfg: Load softkeys for managing user configuration files are located along the right side of the General menu shown in Figure 4.2. The currently selected configuration file appears in the Configuration text box in the General System menu to the left of the circled Set Time and Set Date buttons shown in Figure 4.2.
The **Cfg: Save As** soft key is used to create a new configuration file. When this soft key is pressed, a file name dialog box is presented to allow the user

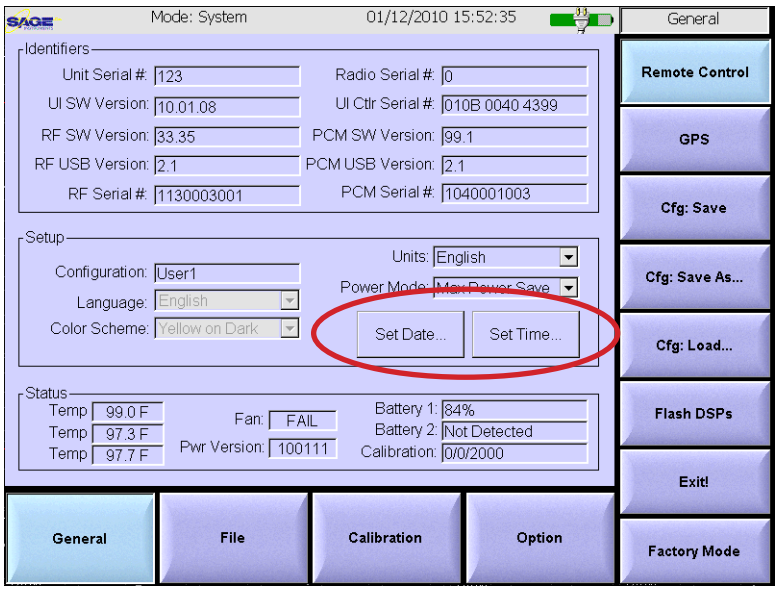


Figure 4.2 General Menu

to enter the file name for the configuration file. The current system configuration will be stored in this file.
The **Cfg: Save** soft key is used to update the currently selected configuration file. Any configuration changes will be written into the file displayed in the Configuration text box of the General System menu.
The **Cfg: Load** soft key is used to select and load a new configuration file into the UCTT. When the Cfg: Load soft key is pressed, the user is presented with a dialog box containing a list of stored configurations as shown in Figure 4.3. Move the highlight to the desired configuration file and press the OK button to load the configuration. The newly selected configuration file name will appear in the Configuration text box in the General menu.

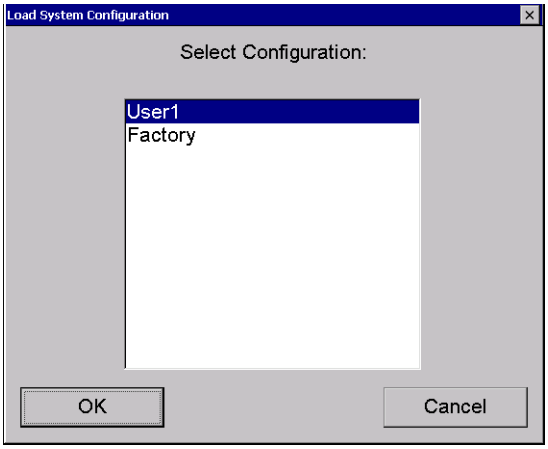


Figure 4.3 User Configuration Selection

4.2.3 Remote Control Menu

The Remote Control Menu allows the user to remotely control the UCTT via an ethernet connection. The local keyboard/touchscreen display cannot be used while in the remote control mode. To initiate a remote control session, first ensure that the UCTT is connected to the ethernet network via its 10/100BaseT connector.
Pressing the Remote Control soft key in the upper right corner of the General menu will bring up the remote control menu shown in Figure 4.4. The IP Address assigned to the UCTT will be displayed in the window circled in Figure 4.4. The **Transcript** window below the IP Address displays the received commands and responses.
Using a remote computer with network connectivity to the UCTT, Telnet to the UCTT IP address to initiate a test session. Upon connecting to the UCTT, the user will receive the following prompt at the remote computer:

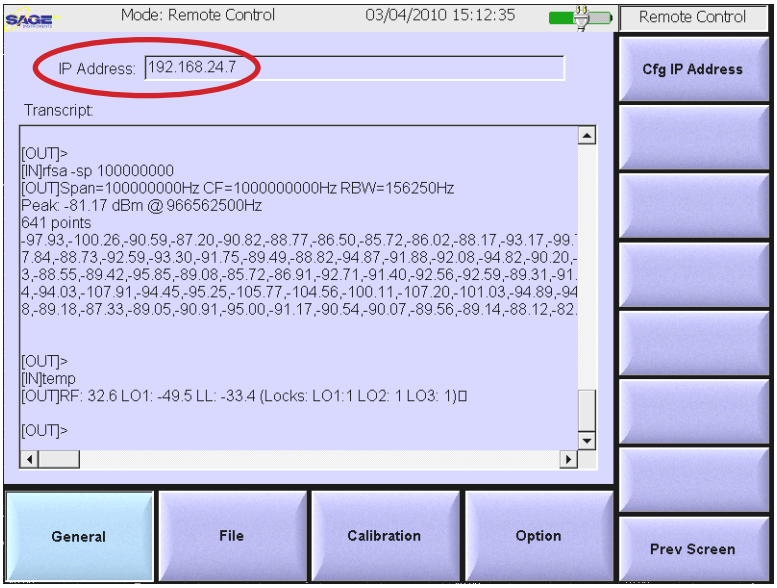


Figure 4.4 Remote Control Menu

> Sage 96X Command Language version 9.11.10
> Welcome to the Sage Instruments Telnet Service on VGXtest
>
> >

The **Prev Screen** soft key is used to exit the remote control menu, if this key is pressed while a remote session is active, the session will be terminated. The File or Option Soft Keys can also be used to exit the remote menu and session.

4.2.4 IP Configuration

The IP interface used for remote control of the UCTT can be configured by the user. The IP configuration menu is selected by pressing the **Cfg IP Address** Soft Key found in the upper right corner of the Remote Control menu shown in Figure 4.4. The IP Configuration Menu is shown in Figure 4.5.

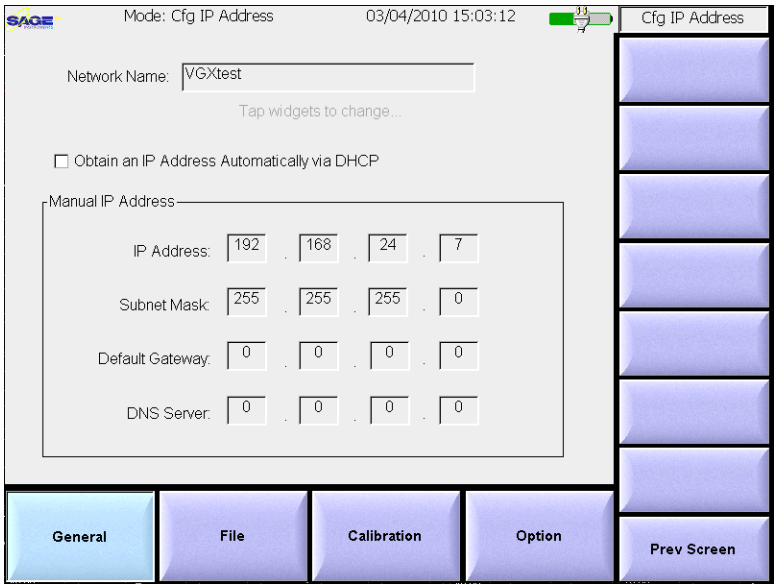

Mode: Cfg IP Address
03/04/2010 15:03:12
Cfg IP Address
Network Name: VGXtest
Tap widgets to change...
Obtain an IP Address Automatically via DHCP
Manual IP Address
IP Address: 192 . 168 . 24 . 7
Subnet Mask: 255 . 255 . 255 . 0
Default Gateway: 0 . 0 . 0 . 0
DNS Server: 0 . 0 . 0 . 0
General
File
Calibration
Option
Prev Screen

Figure 4.5 IP Configuration Menu

The IP configuration values can be changed by tapping on the desired value. When a parameter is tapped, a text or numeric entry dialog box will be presented for data entry. The **Network Name** parameter is used to identify the UCTT in the network.
The UCTT can be assigned a static or dynamic IP address. Checking the **Obtain an IP Address Automatically via DHCP** check box will cause the UCTT to have a dynamic IP address. In this case the address is assigned by the DHCP server on the network.
If the Obtain IP Address check box is not checked, a static IP address can be manually specified in the **Manual IP Address** section of the IP configuration menu shown in Figure 4.5.

4.2.5 UCTT Remote Commands

UCTT remote control commands can be entered at the > prompt. The following is a list of valid commands. Entering the help command at the prompt will bring up a list of valid commands. Entering help followed by a command will display the help for the selected command.

Administrative Commands:

cal	For Sage Factory use only
exit	Exits the command interpreter and closes associated network resources
help	Allows all users to access help on the various built-in commands
temp	Displays the radio temperatures
version	Displays the command interpreter version

Test Commands:

idle	Controls the current radio Tx & Rx status
rfsa	Detects the highest amplitude signal in the specified frequency span
sgen	Controls the radio Transmitter
tune	Tunes the radio (Tx/Rx)

The following text describes each command in detail. Note that the command parameters show the proper units, IE Mhz or Hz, in parenthesis after the parameter description. Command parameters enclosed in square brackets are optional parameters. Default values will be used if these parameters are omitted. No spaces or tabs are allowed in parameters.

idle
The idle command is used to turn off the radio transmitter or receiver. The idle command should be issued before using the transmitter or receiver. This ensures that the transmitter or receiver is placed in a known state before measurements are made.

idle [-tx] [-rx]

This command defaults to turning off both the receiver & transmitter. The flags can be used to turn off just the current receiver task or the current transmitter task.

[-tx]	Idle Tx Only (Optional)
[-rx]	Idle Rx Only (Optional)

No spaces or tabs allowed in parameters.

rfsa
The rfsa command is used to request a radio measurement. The radio must be configured using the tune command before issuing the rfsa command. The rfsa command will return a frequency and level measurement corresponding to the highest amplitude peak detected in the requested frequency span. Additionally, the -sp option will cause the command to return multiple measurements over the specified frequency span. This test is a single-shot, it runs, retrieves the data, then unregisters itself.

Results Bandwidth (rbw) cannot be specified manually if span is less than 5 MHz.

rfsa [-w] [-rbw] [-nav] [-sp] Span

. Use the 'tune' command for
tuning...

[-w] Window Type: 0=Uniform 1=KAISER (default) 2=HANNING 3=HAMMING 4=GAUSS (Optional) 0 to 4
[-rbw] Results BW (default=auto) (Optional) 100 to 50000
[-nav] # Avg (default=1) (Optional) 1 to 1000
[-sp] Return Spectrum Data (Optional)
Span (Hz): 10000-640000000, 10kHz-640Mhz
No spaces or tabs allowed in parameters.

sgen
The sgen command causes the radio transmitter to generate a single frequency signal. The command parameters specify the level and frequency of the generated signal.

sgen [-rsvd1] Center_Frequency Level.

[-rsvd1] Reserved: CAL Only! 12 bit DAC Value: 0-4095
Center_Frequency (MHz): 700 to 2200, 700-1000 Mhz, 1.6-2.2 GHz
Level (dB): 0 to -60
No spaces or tabs allowed in parameters.

tune
The tune command sets the center frequency of the radio receiver. This command must be issued before the rfsa command can be sent. The individual attenuator settings are derived from the desired level. The preamp will be off unless the flag is specified.

tune [-p] [-rsvd1] [-rsvd2] Center_Frequency Attenuation

[-p] Preamp On (default off) (Optional)
[-rsvd1] Reserved: CAL Only! 2 * IF1 Atten (dB): 0-31 (Optional) 0 to 31
[-rsvd2] Reserved: CAL Only! ATTN_Names value (Optional) 0 to 9
Center_Frequency (Hz): 698000000-2700000000, 700-1000 Mhz, 1.6-2.2 GHz
Attenuation (dB): 0-61
No spaces or tabs allowed in parameters.

4.3 File Menu

The File menu is used to export various types of files from the UCTT, manage options and upgrade system software. An external thumb drive attached to the USB-A connector of the UCTT is used to transfer files and upgrade software. Exportable files include screen captures, Data and Log files. In the System mode, the File menu is selected by pressing the **File** Menu key shown circled in Figure 4.6. The File System menu is shown in Figure 4.7. The two radio buttons circled in Figure 4.7 allow the user to switch between viewing Screen Capture files or Data/Log files stored in the UCTT. Below the list of files is a text box displaying the status of the external thumb drive. If no thumb drive is connected, the status displays “Not Present”.

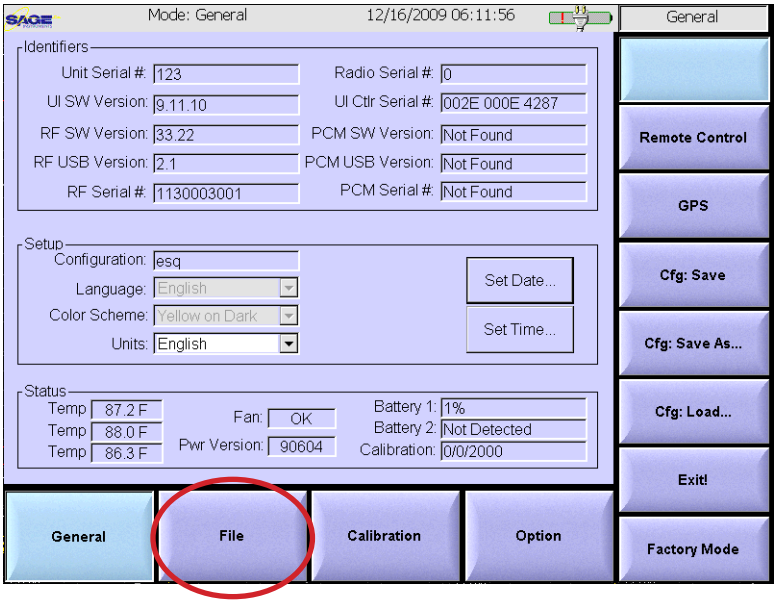


Figure 4.6 File Menu Softkey

4.3.1 Exporting Files

Screen Captures or Data/Log files can be exported from the UCTT by highlighting the desired file and pressing the **Copy to Ext** soft key located in the upper right corner of the File System menu shown in Figure 4.7. This action will cause the selected file to be copied to the external thumb drive.

4.3.2 Deleting Files

The **Delete Local** soft key is located below the Copy to Ext soft key in the upper right of the File System sub menu in Figure 4.7. This soft key is used to delete Screen Captures or Data/Log files from the UCTT’s memory. To delete a file, highlight the desired file and press the Delete Local soft key.

4.3.3 Upgrading Software

The UCTT system software can be field upgraded. The upgrade files are first loaded onto a USB thumb drive. The thumb drive is then inserted into the USB-A connector of the UCTT. Pressing the **Upgrade** soft key circled in figure 4.7 will cause the UCTT to initiate the software upgrade process using the upgrade files stored on the thumb drive. Once the Upgrade soft key is pressed, the upgrade process will proceed automatically.

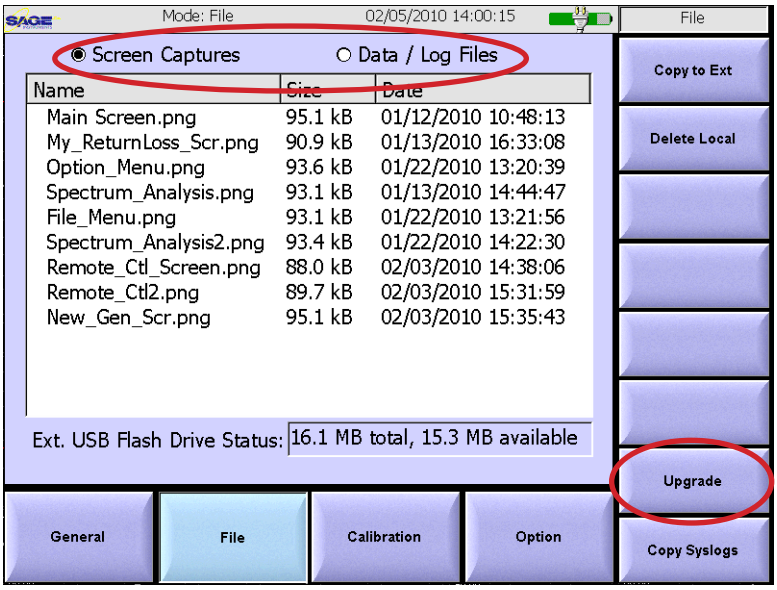


Figure 4.7 File Menu

4.3.4 Exporting System Logs

The UCTT maintains several error and event log files. If the UCTT malfunctions, these logs can be exported to facilitate trouble shooting and diagnostic activities. To export the UCTT log files, first insert a USB thumb drive into the USB-A connector of the UCTT. From the File menu pictured in Figure 4.8, press the **Copy Syslogs** soft key circled in the menu to copy the UCTT log files to the USB thumb drive.

4.4 Instrument Options Menu

The UCTT has software option activation keys that control the availability of the different measurement features such as spectrum analysis, DS1 BERT, Distance to Fault etc, These options can be viewed and managed via the Option menu. Pressing the **Option** key circled in Figure 4.9 will bring up the Option menu shown in Figure 4.10. The checked options correspond to options that are currently available. Unchecked options can be enabled by obtaining an activation key for the desired option from Sage. Pressing the **Activate Key** softkey circled in Figure 4.10 will bring up the Activate Options dialog box. The alphanumeric activation key obtained from Sage is then entered into the dialog box to activate the desired option.

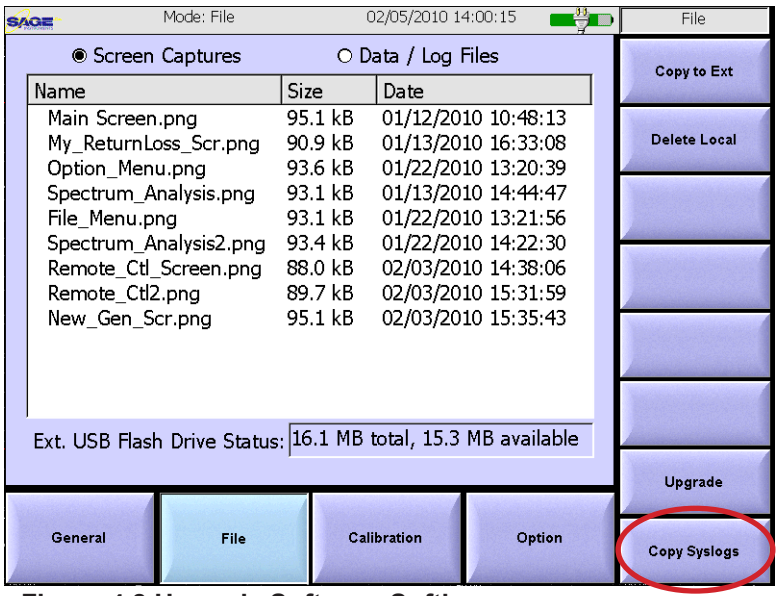


Figure 4.8 Upgrade Software Softkey

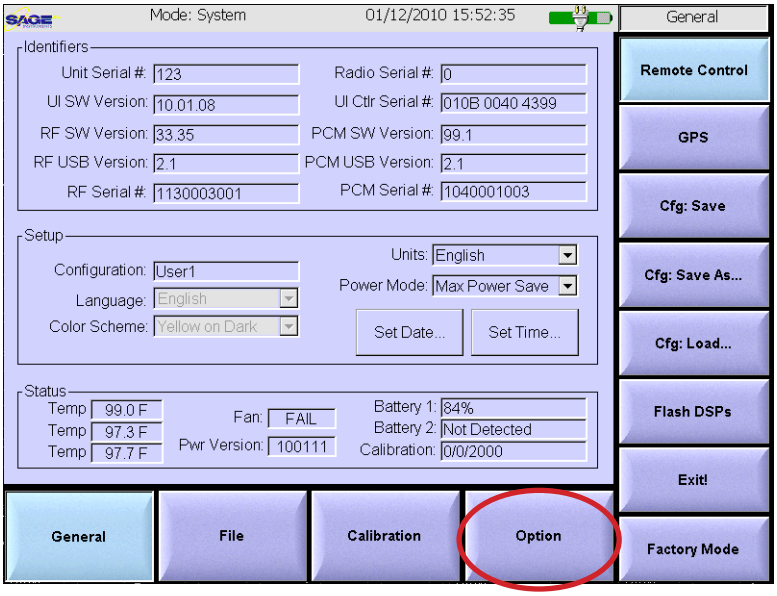


Figure 4.9 UCTT Option Menu Softkey

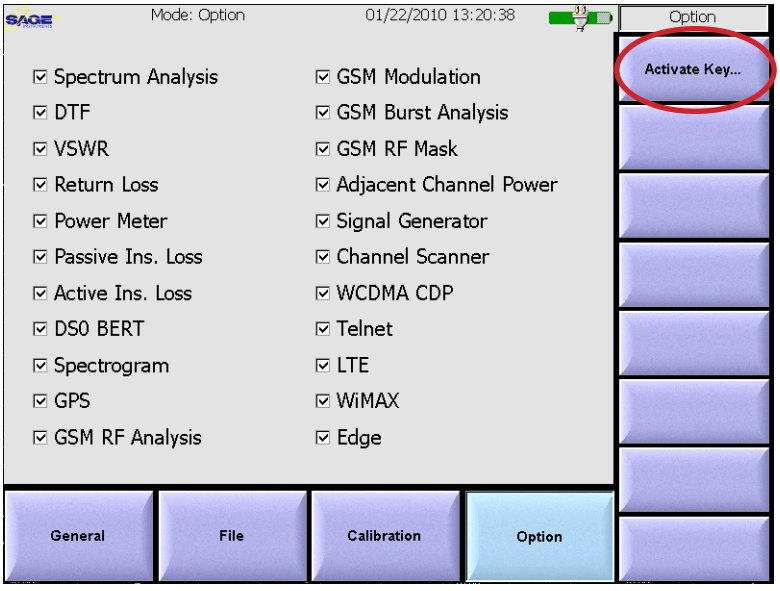


Figure 4.10 UCTT Option Menu

5. UCTT Environmental Specifications

The UCTT is designed per MIL-STD-810-F, to be operated in harsh environments including temperature extremes, rain or immersion in liquid and shock or vibration. The following details the environmental conditions for operating the UCTT.

Operating Conditions:
- Temperature Range -10C (14F) to 55C (130 F)
- Humidity 85%
- Altitude 5000 Meters

Storage Temperature Range -51C (-60F) to 71C (160 F)

6. UCTT Warranty

Product Warranty

Sage Instruments products are warranted to be free from defects in materials or workmanship for a period of one year from the date of shipment. Sage Instruments further warrants that each product will execute its software programming instructions. During the one year warranty period, Sage will, at its option and expense, either repair or replace products which prove to be defective.

Limitation Of Warranty

This warranty does not cover repairs for damages from accident, misuse (including modification to or addition of software), tampering, improper maintenance, repair by anyone not authorized by Sage Instruments, or shipment in unapproved packaging. Out of-warranty repairs performed by Sage Instruments are billed to the customer. Sage Instruments does not warrant that the operation of its products will be continuous or error free.

Exclusive Remedies

The remedies provided in this warranty are available exclusively to the original buyer of the Sage Instruments product. Sage Instruments is not liable for consequential damages or damages to any party other than the original buyer. Sage Instruments specifically disclaims any implied warranty of merchantability or fitness for a particular purpose. No other warranty is expressed or implied.

Repaired Products Warranty

Sage Instruments products that are repaired during the initial one year warranty period by Sage Instruments or its authorized representative are further warranted for a period of 90 days from the date of shipment from the repair facility. All out-of-warranty repairs performed by Sage Instruments are warranted for a period of 90 days.

Shipping Instructions

To exercise the Sage Instruments warranty, contact a Sage Instruments customer service representative and obtain a returned material authorization number RNA. Include a detailed description of the problem and the conditions and circumstances under which the symptoms occurred. Ship the product in its original packaging, or in packaging approved by Sage Instruments. If unapproved packaging is used, this warranty is void. Shipping charges, duties, and taxes must be prepaid. Return shipping to the customer is paid by Sage Instruments.